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AUTHOR Williams, Martha E.
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ABSTRACT

The users of online retrieval systems can and should provide feedback to the system operators or vendors to influence them to make changes and further improvements, or to reinforce operator's decisions to make changes in the systems. All members of the database chain--database producers, processors, search service brokers, searchers, and end users can influence those above them in the chain. This paper discusses areas in which influence can be exerted, such as (1) services provided, (2) databases offered, (3) system features and characteristics, (4) service policies, and (5) pricing and payment. It delineates forums, routes, and methods for providing feedback: describes factors considered by vendors prior to implementing changes: and provides a discussion of changes that have been implemented by U.S. vendors on the basis of suggestions provided by users. Changes implemented by the National Library of Medicine (NLM), Bibliographic Retrieval Services (BRS), Lockheed Information Service (LIS), and System Development Corporation (SDC), are cited. (Author/RAA)

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USER FEEDBACK--
INFLUENCE ON ONLINE SYSTEM OPERATORS

Martha E. Williams
Coordinated Science Lab
University of Illinois
Urbana, IL USA

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INTRODUCTION

Users of online retrieval systems can and should provide feedback to the system operators, or venders, in order to influence them to make changes and further improvements, or to reinforce the operators' decisions to make changes in the systems. All members of the database use chain--database producers, processors, search service brokers, searchers, and end users can influence those above them in the chain.

This paper discusses areas in which influence can be exerted, forums, routes, and methods for providing feedback, factors considered by venders prior to implementing changes, and a discussion of changes that have been implemented by U.S. venders on the basis of suggestions provided by users. Changes implemented by the National Library of Medicine (NLM), Bibliographic Retrieval Service (BRS), Lockheed Information Service (LIS), and System Development Corporation (SDC) are cited.

The major areas where user feedback can be useful include the following: (1) services provided, (2) databases offered, (3) system features and characteristics, (4) service policies, and (5) pricing and payment. Services provided by venders include retrospective, current awareness, and private file searches, as well as adjunct services such as document ordering, document delivery, training sessions, etc. Database selection, as well as database mounting and data element inclusion, are often based on user suggestions. System features and characteristics can be improved and increased in number, so long as they fit within the basic design criteria or the design philosophy of the system. Service policies are very definitely influenced by user needs and preference--particularly such things as days and hours of service. Pricing, of course, is dependant on expenses incurred by the vender in providing service, but they are related to market or user pressures.

DATABASE USE CHAIN

Users of online services can influence system operators just as all members of the database use chain (Ref. 1) can influence those above them in the chain. The database use chain involves the following members:

Database Producer

Online System Vender

Online Search Service Broker

Information Specialist in User Organization

End User

The vender is the first party user; if a broker is involved and if the broker provides the search results to an information specialist rather than to the end user, the broker is the second party user, and the information specialist is the third party user, making the end user the fourth party user. If the information specialist does his/her own online searching, the information specialist is the second party user.

The database use chain can be looked at in further detail, bringing in others who are involved, but who are less directly involved with the specific bibliographic references retrieved in a search than are the user groups described above. An expanded database use chain involves:

Database Producer

Online System Vender (Processor)

Search Service Manager--in brokerage

Searchers--in brokerage

Search Service Manager--in user organization

Searcher--in user organization

End User's Manager

End User

Each of these has a different kind of responsibility and a different motivation for providing database services. The database producer is interested in obtaining sales or use of his databank. He also wants to ensure that the files are used properly. The database processors are interested in sales/use of their systems--not specifically the database, but the database on their system. They are concerned that the files be properly used and that the system be properly used, because improper use leads to dissatisfied users, or dissatisfied customers. The managers of search services are interested in the system, but they are also interested in increased productivity of their staff and improvement or expansion of services. The searchers, or intermediaries, are also interested in sales or use of the system, because they have to promote it or be sure that it is used, or they themselves will not function effectively. Searchers are also interested in the proper use of files and systems, or they cannot provide an effective service to their users. Both end users and the end users' management are interested in results. They are concerned with the impact that online searching (just as any other service) has on the research or development that is carried out in the organization. They are interested in the increased productivity of their researchers; they are interested in anything that saves dollars or time. They do not want to spend a lot of time in doing manual library searching, but could use an online searching service to save time in acquiring information. The motivations differ for the different classes of users or members of the database use chain.

It is obvious that any change made by a database producer, the top of the database use chain, will affect all members lower in the chain but one can also look at these classes of database users in the reverse direction. That is, the impact is not only on the user, but the users can have an impact

on the providers. The users at every level may communicate their needs and views in order to change or improve the resources or the services that are provided to them by those above them in the chain. In terms of providing near future response or having an impact that will be fairly close at hand, the end user or his manager may communicate his problems or needs to the search services level, to the online vender, and eventually, back to the database producer, and at each level the number of contacts required decreases. Impacts can be made not only for near future results. Long term results can be effected, too. Database producers and online venders are more likely to be interested in short-term changes than in changes that may require ten years to produce. They have immediate economic concerns; they must be at least self-supporting, hopefully make money, and provide a useful and good service. They may not be interested in doing the kind of research and testing that is necessary to produce very long term changes. Needs that require long term research should be communicated by users to researchers or research sponsors who then can see that research is done. The results of those research projects, when completed and publicized, can be used by database producers and/or online venders for the subsequent benefit of search service organizations, searchers, and users.

USER INFLUENCE ON SYSTEM OPERATORS

Having looked at the entire database use chain and keeping in mind that influence can be had in both directions--up and down the chain--I will now concentrate on the influence users can have and have had on system operators. In this context, the users would include all levels of users below that of the online venders--search service managers, searchers, and end users and their managers.

Certainly any member of the database use chain can and should provide feedback to the online vender in order to influence the vender to implement a change.

They may provide feedback on their requirements, preferences, limitations and dislikes either individually or collectively. End users, searchers, service managers, or brokers individually or collectively -- represented by groups such as user groups (database, vender system or geographic region), professional societies, user organizations, associations of organizations (eg. ASIDIC and EUSIDIC), advisory committees, workshop/seminar attendees or educators -- can make their views known to system operators. In general, the strength of influence is directly proportional to the number of users the group represents.

Individuals and groups can provide positive or negative feedback through various routes -- letters, phone calls, petitions, online messages and dialogue at public meetings. Feedback can also be provided by indirection -- through disuse of a database or feature, through high levels of use, or through publications.

The venders, or operators, are dependant on the users and do pay attention to their comments and suggestions. Venders cannot operate in a void and stay in business. They make many changes (including additions and deletions to the system, database collection, and service areas) based on user feedback. This is not to say, however, that an online operator will implement every or even the majority of the changes suggested.

FACTORS INFLUENCING OPERATOR CHANGES

The changes the venders do implement will depend on a number of factors, including: (1) the improvement or added value the vender perceives the change making in the service; (2) the number of people that suggest the change; (3) the weight or amount of influence specific requesters of change may have with the vender (based on dollar value of the search business they represent, stature in the information community, or even nuisance value); (4) cost of

implementing the change (in terms of computer programming, machine time, storage, etc.); (5) the amount and availability of personnel time required to make the change; (6) total lapse time required to design, test, and implement the change; (7) the impact the change will have on other parts of the system--will the change be a completely new feature, totally replace an existing feature, or will it provide an alternative in a downward-compatible manner?--(8) the amount, time, cost, and effort required to apprise and train users of the change-risk factor; (9) the existence of, or probable adoption of, the change by competing venders; (10) the approximate percentage of the venders' market that will or could be affected by the change; (12) the likelihood of increasing revenue in the near and distant future; (13) the possibility of "turning off" existing users who are habituated to features that would be affected by the change; (14) the possibility of causing ill will on the part of users who do not understand a change; (15) priority list of scheduled changes; (16) the compability of the change with the underlying system philosophy; and (17) convenience vs. feasibility. The venders must consider these factors before implementing changes (other than trivial ones). After balancing the pros and cons, a decision can be made.

AREAS OF INFLUENCE

Users assist venders by making suggestions that they perceive as potential improvements. Some suggestions may have previously been considered by venders and others may not have occurred to them. Even if an idea is not new to a vender the fact that the suggestion comes from a user rather than only from the system staff adds value to the suggestion. Vender responses to suggestions vary. They weigh the pros and cons of individual suggestions according to the factors listed above. Suggestions may be good or not; however, according to the venders, very few are in the ridiculous category. Some suggestions

are implemented and some are not. Some are implemented and used and others are implemented and seldom used. Some are handled quickly because they are easy to implement and others may take years.

Users not only provide suggestions but, on a day-to-day basis, provide the invaluable service of monitoring the system. They notify the vender as soon as the system goes down, and they also help diagnose hardware problems by letting the vender know what has happened to them.

Users can influence system operators to make changes or improvements in their online services. There are five basic areas where influence can be exerted. They include: (1) services provided, (2) databases offered, (3) system features and characteristics, (4) service policies, and (5) pricing and payments.

Naturally, every vender starts with a well-designed system, having made some basic marketing and operational decisions in all these areas. However, they realize that the total online retrieval field is changing rapidly, that technology is changing, that as their economic situation improves they can afford to make changes, that they must keep up with, if not be ahead of, the times, and that some of their initial decisions may not have been the best.

SERVICES OFFERED

The operators of online service centers can offer a wide variety of services. Services may include the following:

Retrospective Search

Current Awareness

Private/Personal Files

Document Ordering

Statistical Manipulation

News Announcements

System Manuals

User Aids

Educational Packages

Online Training

Test Files

Workshops/Training Sessions
- with/without hands-on use
- vender/user site
- preliminary/advanced
- system specific
- database specific

All of the venders of bibliographic search services initiated their operation by providing retrospective searching of one or more bibliographic databases. At the time that the major U.S. venders started offering services to the public, batch-operated SDI services were being offered by a number of centers. Competing with successful batch SDI operators would not have made good sense at the time. Subsequently, many of the users of batch SDI became users of online retrospective search services. Some have switched their SDI profiles to the online services and some continue with batch SDI but use the online retrospective file to develop their current awareness profiles. Though none started with SDI, all of the major online venders now provide it.

User demand has been influencial in getting SDC and LIS to provide a private file capability; BRS will initiate such a service in 1978. The "electronic mailbox" online document ordering service provided by SDC was a result of user requests.

The very existence of MEDLINE is in a way a response to user demand. The MEDLARS II system was originally planned to function as an online data input file. It was not planned as a retrieval system. NLM's AIM TWX experiment with online retrieval was intended to show whether or not there would be a demand for online searching. The acceptance was immediate and influenced NLM's development of the MEDLINE retrieval service.

DATABASES OFFERED

Users of online system have been very influential in determining which databases are put up online. Most venders are willing to put up any database for which they will have a large enough customer base. Users can influence vender decisions regarding: the type of databases mounted--bibliographic numeric or factual; the specific databases to be put up; the numbers of years' worth of a file to be offered; the data elements needed for search and/or display--citation plus index terms, codes, abstracts, or text; and the manner in which the database is mounted--data elements required for search, data elements required for display/print, data elements to be separately identified, and data elements to be included in the basic inverted file (primary index).

All of the venders have been influenced regarding database offerings. LIS responded to user requests in offering Pollution, Excerpta Medica, NICEM, Textile Abstracts and International Pharmaceutical Abstracts for example. They have also declined to put up databases that they consider duplicative, for example, LIS felt that the overlap between IAA and Compendex was too extensive to warrant their mounting IAA in addition to Compendex. LIS was influenced to put up more of the back years of CACon and BIOSIS than they had originally planned to. LIS was also influenced to include the original article publication year as a controllable parameter, and they were influenced to put corporate source information into a secondary index rather than the primary index. NLM has for the most part determined which databases it would create and make available. They did, however, respond to user suggestions and generate a separate file for reviews. Unfortunately when they ran out of space they were forced to take the file down again. NLM monitors file usage and may remove a file that is under-used. SDC put up Psychological Abstracts and INSPEC in response to user requests. They also routinely check with users

regarding database loading and they have a select group of users test the file before announcing its availability to the public. If SDC users find that one of their databases is difficult to handle with the present file design SDC will often reload the file. When BRS went into business with its initial group of nine databases, the nine were chosen by the group of potential users who had agreed in advance to use BRS. BRS now has a user board with a database committee. The database committee recently surveyed BRS users to find out which databases they would like put up next. The product of the survey was a ranked list of 10 databases. The highest on the list was Social Science Citation Index and BRS is adding it in 1978. BRS management will negotiate with the user group regarding the balance of the suggestions.

SERVICE POLICIES

Search service policies are developed with users/clients in mind and some are changed as a result of user feedback and suggestions. Two examples of policy areas where users influence venders are in relationship to hours of service and use of systems in formal curricula. Search service policies are established to govern such things as: contractual requirements, days and hours of service, discounts for off-hours or weekends, allowable lapse time for delivery of search results, compensation for down time or system errors, mandatory or optional training in the use of the system, update frequency for databases, security for passwords, level of assistance provided by the vender's answer desk, and frequency and specificity of bills/invoices.

Virtually all of the venders have increased the number of hours during which they offer online searching in response to user pressure. In 1977 NLM extended its hours from 3 A.M.-8 P.M. to 3 A.M.-9 P.M. in order to

accommodate the states in the western time zone. SDC responded to user pressure and did away with their "window" system of making certain databases available only during certain hours. LIS, NLM and SDC have extended search services to Saturdays to accommodate users. BRS plans to do the same but at present they need the machine time on Saturdays for their own testing.

Some venders have developed special policies for the use of their systems by library schools and schools of information science as a part of their curricula. SDC has a special package for library schools including training of one instructor, manuals and connect hours for 15 databases at a rate of $15.00/hr. LIS offers Saturday searching of 27 databases to library schools at the discounted rate of $15.00/hr. BRS offers their search services at $8.00/hr. with no minimum number of hours required.

SYSTEM CHARACTERISTICS & FEATURES

Users can influence venders regarding system features and characteristics. However, to a large extent, these must fall in line with the basic philosophy of the design of the system. The design of, and features included in every system are purportedly, at least, geared to user needs and ease of use, but it is the structure of the system and the manner in which modules and subsystems relate to each other that determines whether changes can be implemented readily or not. All online systems must be dynamic. They must be able to adapt to hardware and communications changes which inevitably occur. Additionally, they should be able to accomodate upgrading and improvement of system features.

Some categories of system features that have been changed (by at least one U.S. vender) in response to user suggestions are listed below. The

variable features within each category indicate areas where users have exerted their influence.

(1) "Log in" and "Begin"-These activities may be complicated or simple and may have a long form or a short form; user pressure influenced the development of the short form. (2) Specification of Terms-The manner in which search terms are specified in a search statement includes use of Truncation, the use of online dictionaries, and the specification of terms by data element type. The dictionaries may or may not include related terms from a controlled vocabulary; they vary with respect to the number of terms included in a display; and they vary with respect to scrolling forward and backward. Truncation may be applied to suffixes (right), prefixes (left), or infixes (middle) of a term. The length of the string which is truncated may be limited or unlimited depending on the system. Truncation may be applied simultaneously with specification of a search argument or separately. (3) Specification of Term Relationships-This refers to the application of logic to indicate the relationships between terms. Logic features vary; they may include Boolean logic, nested logic, and context logic, wherein the capability for specifying context may be limited to word proximities within a given data element or between data elements. Logic features vary with respect to the way in which the operators used must be sequenced and they vary with respect to the symbols used to indicate the logic functions desired. (4) Command Languages and Protocols-Command languages vary with respect to the functions performed, and the terms or symbols used to specify a command. Some systems require that the command term precede the search term or statement to which it applies. In some situations the command may be applied as a default condition and need not be specified. Commands may be in full or there may be short forms to represent them (e.g. select vs S). In some systems specific

commands are mode-dependent. (5) Handling of Retrieval Sets-Sets of references may be retrieved in a separate search operation or the request to retrieve specified sets may be specified at the same time that a logic or communications network command is specified. Retrieval sets may be retained for varying lengths of time following a computer failure. (6) Handling of Search Strategies-Search strategies may, in some systems, be retained for subsequent use against the same database or against other databases. (7) Work Space-The amount of work space available to a searcher during the development and execution of a search varies from system to system. Some allow the searcher to request more space and some allow the searcher to "free up" the space occupied by search results that are no longer needed. (8) System Responses and Diagnostic Messages-These vary from system to system. They may be easy to understand or complicated; they may be explained online; there may be both long and short forms of them available at user option; responses and messages take varying times to display. (9) Data Base Switching-This is a feature available in all systems with multiple databases but the differences exist with respect to the ease of making a switch. Some require a logoff and logon to the new database. (10) Identification of Last Update of a Database-This capability permits a user to run his/her own SDI on database updates. (11) Online Display of Time Used and Cost of Search-This feature permits the user to determine his expenditures as of the point in time when he requests the cost information; he can then decide how much additional searching he is willing to pay for.

Merging of search results from searching multiple databases is a feature that is not now available on any of the systems with which I am familiar. It is a feature in which users have expressed interest. Merging

of results could be done alphabetically by author to provide a single alphabetic bibliography; alternatively, they could be arranged by journal or by date of publication or any other meaningful way. Merging of search results should also involve removal of overlap, as users prefer not to receive or pay for printing the same citations several times.

A few specific examples of system changes influenced by users of specific systems are given in the following paragraphs.

Users influenced LIS to add the truncation capability, to develop an internal (infix) truncation feature, and to increase the number of terms retrieved on a truncated string. When initially implemented, LIS's truncation would retrieve only 100 word forms; user pressure increased the number in several stages to 500, to 1,000 to its current 2,000 limit. Initially the LIS "expand" command provided a fixed number of terms in the alphabetic dictionary display. Users suggestions led to the "paging" capability that allows virtually unlimited "paging" through the dictionary. LIS was also influenced to increase user work space from 200K to 500K to 1200K, and they plan to implement a "virtual" work space feature called "copysets."

SDC was greatly influenced by users in the development of the new ORBIT 4 system. Two changes specifically requested by users are: (1) the removal of the requirement to designate a command by putting quote marks around the command, and (2) the addition of a capability to execute commands in the order in which they are entered.

BRS was influenced to allow users to specify the default format for printing search results. Each user can determine his own default and it is associated with his Password and ID. BRS changed the limit on the number of terms, to which truncation is applied, from 100 to 800 because

of user pressure. Users have requested several other system changes that BRS plans to implement. These include: permitting the search mode to be a default mode rather than having to specify it; the use of abbreviations for commands; response anticipation; and the addition of left truncation.

PRICING AND PAYMENT

The prices charged by online service operators in the private sector must cover a variety of operational costs including: database purchase, lease or license fees; databases royalties; hardware purchase or rental; software maintenance and upgrading; equipment and materials; communication charges; personnel salaries for all aspects of planning, design and operation; and overhead. Operators in the public sector may recoup these expenses but often are not required to do so. Private sector venders must recoup these expenses and also build into their prices a margin of profit if they wish to expand and improve services.

Given these constraints one might think that users would have little influence on pricing, but that is not the case. To some extent prices reflect what the traffic (users) will bear. In some cases higher prices reflect added system capability, but there are many users who are not sufficiently sophisticated to recognize this. They often are more price sensitive than quality sensitive and will opt for the cheapest route. The supply and demand relationship operates in the information market just as in other markets.

The most significant example of users influencing pricing is the case of BRS. BRS came into being virtually in response to user requests. A large group of users of a state-operated online system, who were dissatisfied with aspects of the service, approached Ron Quake and suggested that he provide

a commercial service that would be broader than the state-supplied service. The group of users committed themselves to the service before BRS was in operation. Although they did not put up money in advance they did agree to subscribe to the service at a specified level. Some even signed contracts in advance. The users told BRS what level of charges would be tolerable and BRS responded to this by telling the users what they could get for the indicated amount. It was this type of user influence on prices that dictated BRS's maintaining only two years' worth of most databases online. When BRS management wants to change a price they review the change with the user board, solicit their feedback, defend the position, and present trade offs between price and service.

None of the other venders have been so greatly influenced in their pricing by their customers. NLM's prices have not been influenced by users in the same way at all. NLM increases prices when demand gets too high. In effect, prices are geared to hold the demand down to the level that NLM can handle.

Although both LIS and SDC began offering group discounts shortly after BRS went into operation with its group discount prices, the decisions to implement volume discounts were made previously and were facilitated by the economic advantage afforded by the addition of improved hardware.

Users influenced BRS with respect to their unbundling of the cost elements in BRS's prices. Users influenced them to offer an alternative to the system of allowing X number of hours with one password for N dollars. The alternative provides fewer hours but more passwords for the same dollars. This was suggested by users because "time sharing" a single password in an institution with multiple terminal locations is not practical. BRS users also influenced BRS to develop an automated accounting system that users would access online to get their own monthly or year-to-date accounting data.

CONCLUSION

There is no doubt that users can and have had substantial influence on system operators. Because users comprise the market to which the systems must appeal, the system operators are willing and anxious to learn of user needs, preferences, and dislikes. Although operators will undoubtedly have previously considered the possibility of adding features or implementing the changes suggested by users, the fact that users voice an interest in the change or feature has a great impact on the vender. Venders do not wish to implement changes for the sake of changes; they wish to implement them for economic reasons and use of the system determines the economics. Systems will continue to grow and new systems will develop but this will not happen in a vacuum. Users should be encouraged to provide their feedback to ensure the user-orientedness of online retrievial systems.

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Specific information regarding BRS, Lockheed Information Service, the MEDLINE service, and System Development Corporation was obtained by telephone interview of representatives of those organizations. The author is not aware of any published studies on the topic of this paper.